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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,372	12/21/2001	Jeffrey A. Trogolo	A-035 US	5146

7590

10/17/2006

AGION TECHNOLOGIES  
60 Audubon Road  
Wakefield, MA 01880

EXAMINER
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CHOI, FRANK I

ART UNIT	PAPER NUMBER
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1616

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/032,372

Applicant(s)

TROGOLO ET AL.

Examiner

Frank I. Choi

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/26/2006, 5/11/2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) 41, 43, 82 and 83 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 2, 3, 6, 7, 10-12, 14-21, 38, 40, 42, 45, 51-54, 56, 60, 61, 63, 64, 66-73, 75-81, 84 and 85 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

**Continuation of Disposition of Claims:** Claims pending in the application are 2,3,6,7,10-12,14-21,38,40-43,45,51-54,56,60,61,63,64,66-73 and 75-85.

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## **DETAILED ACTION**

### ***Status of Claims***

After Amendment (7/26/2006), claims 2,3,6-7,10-12,14-21,38,40-43,45,51-54,56,60,61,63,82-85 are pending with claims 41,43,82,83 withdrawn as directed to a non-elected invention. New claims 84 and 85 are directed to the elected invention and will be prosecuted accordingly.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2,3,6-7,10-12,14-21,38,40,42,45,51-54,56,60,61,63,84,85 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 4-66512, Marans et al. (US 4,403,083), Niira et al. (US Pat. 5,556,699) and Yukei et al.

JP 4-66512 (citation is to the English language translation provided by Applicant) disclose coating silver zeolite with polyurethane resin (pgs. 7, 8, 11,12). The polyurethane resin is prepared by reacting a poly isocyanate compound with a poly ether polyol, such as poly (oxy propylene ether) polyol, and a poly (oxy ethylene propylene ether) polyol (Pg. 9-12). It is disclosed that the coated silver zeolite can be incorporated into a thermoplastic or thermosetting resin (Pgs. 13-15). An example is disclosed in which the antimicrobial zeolite is prepared by addition of silver nitrate and ammonia and thereafter coated with the polyurethane in an amount of 1.5% by weight or 3% by weight (Pgs. 16-18). An example is disclosed in which said coated

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zeolite is incorporated into a polypropylene resin which thereby exhibits antimicrobial activity (Pgs. 19-21).

Marans et al. disclose a hydrophilic polyurethane particles having a diameter of 0.1-100 mils which prepared by adding a resin reactant, which contains a prepolymer containing polyol and isocyanate, drop wise into an aqueous reactant there the volume ratio of water reactant to prepolymer can be infinite, but preferably in the range of 2-200:1 (Columns 2, lines 40-58, Column 3, lines 28-68, Columns 3-5, Column 6, lines 1-56). It is disclosed that because large amounts of water are in the aqueous reactant it is possible to combine a great variety of material sin the aqueous reactant which are otherwise not possible in limited water reacting systems (Column 6, lines 60-65). It is disclosed that a large amount of water soluble or water dispersible materials, such as zeolites, up to about 800% by weight of the amount of water can be added and by homogenously distributing these materials in the aqueous reactant it is possible to effect wide distribution of these materials throughout the finally prepared particle (Column 7, lines 15-29). It is disclosed that the additives can also be combined into the resin reactant, if desired (Column 7, lines 28-31). Further, it disclosed that the hydrophilic nature of the particles was tested by placing the particles in a chamber at 100% humidity for 3 days with the resulting increase in weight providing evidence that they were hydrophilic (Column 8, lines 35-68).

Niira et al. teach that antibiotic zeolites containing silver which further incorporate ammonium ions effectively prevent discoloration of resins into which the antibiotic zeolites are incorporated (Column 2, lines 11-23).

Yukei et al. disclose that sodium nitrate increased elution of silver from silver zeolite and was dose dependent (Abstract).

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The prior art discloses silver zeolite which was prepared by addition of silver nitrate and ammonia and thereafter coated with polyurethane resin which is prepared by reacting a polyisocyanate compound with a poly ether polyol which coated silver zeolite can be incorporated thermoplastic or thermosetting resin, such a polypropylene resin. The difference between the prior art and the claimed invention is that the prior art does not expressly disclose combining 10 to 1000 parts by weight of at least one ion-exchange type antimicrobial agent comprising a ceramic carrier and ion-exchanged antimicrobial agent comprising a ceramic carrier and ion-exchanged antimicrobial metal ions and 100 parts by weight of a hydrophilic polymer where the hydrophilic polymer is in the form of a microparticle having dispersed therein multiple particles of the at least one said antimicrobial agent and an average diameter size of about 15 to about 300 microns. However, the prior art amply suggests the same as the prior art disclose the preparation of hydrophilic polyurethane particles having a size of 0.1-100 mils in which are dispersed zeolites and incorporating of antimicrobial silver zeolite into polyurethane and forming particles having 1.5% by weight and 3% by weight polyurethane.

In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In *re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In *re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (The prior art taught carbon monoxide concentrations of “about 1-5%” while the claim was limited to “more than 5%.” The court held that “about 1-5%” allowed for concentrations slightly above 5% thus the ranges overlapped.); In *re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997) (Claim reciting thickness of a protective layer as falling within a range of “50 to 100 Angstroms” considered prima facie obvious in view of prior art reference teaching that “for suitable protection, the thickness of the protective layer should be not less than about 10 nm [i.e.,

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100 Angstroms].” The court stated that “by stating that suitable protection’ is provided if the protective layer is about’ 100 Angstroms thick, [the prior art reference] directly teaches the use of a thickness within [applicant’s] claimed range.”).

Further, “where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (Claimed process which was performed at a temperature between 40°C and 80°C and an acid concentration between 25% and 70% was held to be prima facie obvious over a reference process which differed from the claims only in that the reference process was performed at a temperature of 100°C and an acid concentration of 10%.); In re Peterson, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003). (“The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.”). As such, it would have been well within the skill of and one of ordinary skill in the art would have been motivated to modify the prior art as above with the expectation that the combination of antibacterial silver zeolites and hydrophilic polymers ranging within the sizes disclosed in the prior art would be effective as antimicrobials and that incorporation of the same into resins, such as polypropylene, would impart antimicrobial activity to the resins. Furthermore, it would have been well within the skill of one of ordinary skill in the art to vary the amount antimicrobial silver zeolite and hydrophilic polyurethane polymer, including within the ratios claimed, depending on the size of the hydrophilic polyurethane particle desired and effectiveness of antimicrobial activity desired.

Also, the prior art discloses the incorporation of ammonium ions to prevent discoloration and sodium nitrate increased the elution of silver ions from silver zeolite. As such, one of

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ordinary skill in the art would expect that addition of the same to the silver zeolite would prevent discoloration and increase elution of the silver ions from the silver zeolite.

The examiner has duly considered Applicant's arguments but deems them moot in light of the new grounds of rejection herein except as follows. The Applicant has argued that the polyurethane in JP-466512 is not hydrophilic in view of a humidity test consisting only of leaving the particles out indoor overnight in which the polyurethane particles did not absorb any humidity (JP 4-66512, Page 18). However, the description of the test did not indicate the ambient humidity. As such, said test is insufficient to establish the polyurethane polymer in JP-4-66512 is not hydrophilic. The JP-466512 uses a combination of polyol and isocyanate. Marans et al. disclose that the combination of polyol and isocyanate forms a hydrophilic polyurethane tested by placing the particle in a chamber for 3 days with a humidity of 100% as indicated above. As such, one of ordinary skill in the art would expect that the polymer in JP-466512 is hydrophilic notwithstanding the humidity test described therein, i.e. the fact that the polyurethane may exhibit non-hygroscopic properties under a given set of testing parameters does not preclude the polyurethane from being hydrophilic.

Therefore, the claimed invention, as a whole, would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, because every element of the invention has been collectively taught by the combined teachings of the references.

Claims 64,66-73,75-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 4-66512 in view of Takebayashi et al. (US Pat. 6,113,936) and WO 94/13726 for the reasons of record and the further reasons below.

JP 4-66512 (citation is to the English language translation provided by Applicant) disclose coating silver zeolite with polyurethane resin (pgs. 7, 8, 11,12). The polyurethane resin



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is prepared by reacting a poly isocyanate compound with a poly ether polyol, such as poly (oxy propylene ether) polyol, and a poly (oxy ethylene propylene ether) polyol (Pg. 9-12). It is disclosed that the coated silver zeolite can be incorporated into a thermoplastic or thermosetting resin (Pgs. 13-15). An example is disclosed in which the antimicrobial zeolite is prepared by addition of silver nitrate and ammonia and thereafter coated with the polyurethane in an amount of 1.5% by weight or 3% by weight (Pgs. 16-18). An example is disclosed in which said coated zeolite is incorporated into a polypropylene resin which thereby exhibits antimicrobial activity (Pgs. 19-21).

Takebayashi et al. disclose a method of microencapsulating silver zeolite with polyurethane where the average diameter of the obtained microcapsule is usually from 0.1 to 300 micrometers, preferably from 0.5 to 200 micrometers, depending on the size of the core particle and the core particle is usually from 0.1 to 200 micrometers, preferably 0.5 to 100 micrometers (See entire reference, especially Column 2, lines 1-13, Column 3, line 9, Column 4, line 66, Column 5, lines 60-64). It is disclosed that the added amount of monomer polymerizable by condensation depends on the concentration of the solid substance, its surface area, its surface condition and the desired amount of the polymer and is usually 0.001 to 20 parts by weight, preferably 0.01 to 10 parts by weight based on one part by weight of said solid substance (Column 5, lines 16-21).

WO 94/13726 discloses hydrophilic polyurethanes prepared by reacting polyols with diisocyanate, which polyurethanes are non-hygroscopic (Page 1, Abstract, Pages 9-11; English language version US 6,399,735, Abstract, Column 5, lines 27-41, Column 6, lines 3-6).

The prior art discloses silver zeolite which was prepared by addition of silver nitrate and ammonia and thereafter coated with polyurethane resin which is prepared by reacting a poly

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isocyanate compound with a poly ether polyol which coated silver zeolite can be incorporated thermoplastic or thermosetting resin, such a polypropylene resin. The difference between the prior art and the claimed invention is that the prior art does not expressly disclose that the thickness of the hydrophilic polymer coating is from about 1 to about 15 microns within the coated particle having a mean average size of about 300 microns or less and a weight ratio of the antimicrobial agent to the hydrophilic polymer form from 1:100 to 1000:1000. However, the prior art amply suggests the same as the prior art discloses encapsulation of silver zeolite where the average diameter of the obtained microcapsule is usually from 0.1 to 300 micrometers, preferably from 0.5 to 200 micrometers, depending on the size of the core particle and the core particle is usually from 0.1 to 200 micrometers, preferably 0.5 to 100 micrometers, where the added amount of monomer polymerizable by condensation depends on the concentration of the solid substance, its surface area, its surface condition and the desired amount of the polymer and is usually 0.001 to 20 parts by weight, preferably 0.01 to 10 parts by weight based on one part by weight of said solid substance. In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In *re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In *re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (The prior art taught carbon monoxide concentrations of “about 1-5%” while the claim was limited to “more than 5%.” The court held that “about 1-5%” allowed for concentrations slightly above 5% thus the ranges overlapped.); In *re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997) (Claim reciting thickness of a protective layer as falling within a range of “50 to 100 Angstroms” considered prima facie obvious in view of prior art reference teaching that “for suitable protection, the thickness of the protective layer should be not less than about 10 nm [i.e., 100 Angstroms].” The court stated that “by stating that suitable

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protection' is provided if the protective layer is about' 100 Angstroms thick, [the prior art reference] directly teaches the use of a thickness within [applicant's] claimed range." Further, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (Claimed process which was performed at a temperature between 40°C and 80°C and an acid concentration between 25% and 70% was held to be prima facie obvious over a reference process which differed from the claims only in that the reference process was performed at a temperature of 100°C and an acid concentration of 10%.); In re Peterson, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003). ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."). As such, it would have been well within the skill of and one of ordinary skill in the art would have been motivated to modify the prior art as above with the expectation that the combination of antibacterial silver zeolites and hydrophilic polymers ranging within the sizes and thickness disclosed in the prior art would be effective as antimicrobials and that incorporation of the same into resins, such as polypropylene, would impart antimicrobial activity to the resins. Further, the prior art further discloses that hydrophilic polyurethanes are prepared by reacting polyols with isocyanates and that the same can be non-hygroscopic. As such, one of ordinary skill in the art would have expected that the polyurethane polymer used in JP 4-66512 was hydrophilic despite the fact that in a humidity test, consisting only of leaving the particles out indoor overnight, that polyurethane particles did not absorb any humidity (JP 4-66512, Page 18), i.e. the polyurethane may be non-hygroscopic to the extent that it does not absorb any

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humidity when left indoors overnight yet be hydrophilic when combined with an aqueous solution or volume of water.

The examiner has duly considered Applicant's arguments but deems them moot in light of the new grounds of rejection herein.

Therefore, the claimed invention, as a whole, would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, because every element of the invention has been collectively taught by the combined teachings of the references.

### **Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

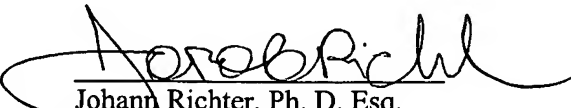
A facsimile center has been established in Technology Center 1600. The hours of operation are Monday through Friday, 8:45 AM to 4:45 PM. The telecopier number for accessing the facsimile machine is 571-273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Choi whose telephone number is (571)272-0610. Examiner maintains a compressed schedule and may be reached Monday, Tuesday, Thursday, Friday, 6:00 am – 4:30 pm (EST).

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Dr. Johann Richter, can be reached at (571)272-0646. Additionally, Technology Center 1600's Receptionist and Customer Service can be reached at (571) 272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Frank Choi  
Patent Examiner  
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October 12, 2006

  
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